UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,013	02/09/2004	Timothy M. Shanley	TRA-093	9796

7590 07/30/2007

Gordon & Jacobson, P.C.
65 Woods End Road
Stamford, CT 06905

EXAMINER	
DEICHMEISTER, NICHOLAS F	
ART UNIT	**PAPER NUMBER**
2616	
MAIL DATE	**DELIVERY MODE**
07/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,013	SHANLEY ET AL.	
	Examiner	Art Unit	
	Nick Deichmeister	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :6/23/2006, 3/17/2005, 8/18/2004, 6/25/2004.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the PDU" in line 12. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the pause timer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 23 recites the limitation "the pause timer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 27 recites the limitation "the PDU" in line 20. There is insufficient antecedent basis for this limitation in the claim.

Claim 38 recites the limitation "the pause timer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 49 recites the limitation "the pause timer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 53 recites the limitation "the PDU" in line 27. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5, 10, 16, 21, 27, 36, 42, 47 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allan et al (U.S. Patent No. 5,946,313) in view of Davies et al (U.S. Patent Application Publication No. 2003/0185249 A1).

Allan et al discloses a mechanism for multiplexing ARM AAL5 virtual circuits over Ethernet, comprising the following features:

Regarding claim 1, method for providing flow control (col. 3, lines 51-54, provide an addressing convention for carriage of ATM over Ethernet) for multiple signal streams (fig. 2, flows of cells 39, 39', 39") over a single ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), comprising: receiving PDUs (protocol data units) (col. 7, line 35, cells) from multiple streams (col. 7, lines 35-39, flow of cells addressed to an end station 39, 39', 39") at a first MAC (media access control) client (fig. 2, E-Mux 21); encapsulating each PDU in a MAC frame (fig. 3A, MAC frame 3) which includes an identification of the stream to which the PDU belongs (fig. 3A, VPI/VCI 40); transmitting the MAC frames over an ETHERNET link (fig. 2, arrows between E-Mux 21 and Ethernet network 25) to a second MAC client (fig.

2, frame manager 33); receiving the MAC frames at the second MAC client (col. 8, lines 30-40, frame manager 33 receives the frame from interface 47); decapsulating each PDU (col. 8, lines 30-40, provides the payload to PDU manager 31); forwarding each PDU (col. 8, lines 30-40, provides the payload to PDU manager 31).

Regarding claim 2, wherein: each MAC frame includes a pre-pended address field (fig. 3A, VPI/VCI 40; col. 7, lines 31-35, VPI/VCI address for the ATM traffic) which identifies the stream with which the encapsulated PDU is associated (col. 7, lines 31-35, VPI/VCI address for the ATM traffic).

Regarding claim 3, wherein: each MAC frame includes a pre-pended address field (fig. 3A, VPI/VCI 40; col. 7, lines 31-35, VPI/VCI address for the ATM traffic) which identifies the stream with which the encapsulated PDU is associated (col. 7, lines 31-35, VPI/VCI address for the ATM traffic).

Regarding claim 16, a method for providing flow control (col. 3, lines 51-54, provide an addressing convention for carriage of ATM over Ethernet) for multiple signal streams (fig. 2, flows of cells 39, 39', 39") over a single ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), comprising: receiving MAC frames from a MAC client (fig. 5, Eth IF 43 connected to E-Mux 43', connected to Frame Mgr 53), each frame containing a PDU (col. 7, line 35, cells) and an indication of the stream to which the PDU belongs (fig. 6A, VPI/VCI 44); decapsulating the PDUs (col. 8, lines 30-40, provides the payload to PDU manager 31).

Regarding claim 27, an apparatus for providing flow control (col. 3, lines 51-54, provide an addressing convention for carriage of ATM over Ethernet) for multiple signal streams (fig. 2, flows of cells 39, 39', 39") over a single ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), comprising: a first MAC (media access control) client (fig. 2, E-Mux 21); and a second MAC client (fig. 2, frame manager 33) coupled to said first MAC client by the ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), said first MAC client having means for receiving PDUs (protocol data units) (col. 7, line 35, cells) from multiple streams (col. 7, lines 35-39, flow of cells addressed to an end station 39, 39', 39"), means for encapsulating each PDU in a MAC frame (fig. 3A, MAC frame 3) which includes an identification of the stream to which the PDU belongs (fig. 3A, VPI/VCI 40), means for transmitting the MAC frames over the ETHERNET link to said second MAC client (fig. 2, arrows between E-Mux 21 and Ethernet network 25), said second MAC client having means for receiving the MAC frames transmitted by said first MAC client (col. 8, lines 30-40, frame manager 33 receives the frame from interface 47), means for decapsulating each PDU (col. 8, lines 30-40, provides the payload to PDU manager 31), means for forwarding each PDU (col. 8, lines 30-40, provides the payload to PDU manager 31).

Regarding claim 42, an apparatus for providing flow control (col. 3, lines 51-54, provide an addressing convention for carriage of ATM over Ethernet) for multiple signal

streams (fig. 2, flows of cells 39, 39', 39") over a single ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), comprising: means for receiving MAC frames from a MAC client (col. 8, lines 30-40, frame manager 33 receives the frame from interface 47) over the ETHERNET link (col. 8, lines 30-40, frame manager 33 receives the frame from interface 47), each frame containing a PDU (fig. 3A, frame contents 3) and an indication of the stream to which the PDU belongs (fig. 3A, VPI/VCI 40); means for decapsulating the PDUs (fig. 3A, MAC frame 3).

Regarding claim 53, an apparatus for providing flow control (col. 3, lines 51-54, provide an addressing convention for carriage of ATM over Ethernet) for multiple signal streams (fig. 2, flows of cells 39, 39', 39") over a single ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), comprising: a first MAC (media access control) client (fig. 2, E-Mux 21); and a second MAC client (fig. 2, frame manager 33) coupled to said first MAC client by the ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), an identification of the stream to which the PDU belongs (fig. 3A, VPI/VCI 40), a MAC transmitter (fig. 2, E-Mux 21), said MAC transmitter transmitting the MAC frames over the ETHERNET link to said second MAC client (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn

to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), said second MAC client having a MAC receiver coupled to said ETHERNET link (col. 8, lines 30-40, frame manager 33 receives the frame from interface 47), said MAC receiver receiving the MAC frames transmitted by said first MAC client (col. 8, lines 30-40, frame manager 33 receives the frame from interface 47), a receive addressing module coupled to said MAC receiver (fig. 2, frame manager 33), said receive addressing module decapsulating each PDU (col. 8, lines 30-40, provides the payload to PDU manager 31); encapsulating each PDU in a MAC frame (fig. 3A, MAC frame 3).

Regarding claim 55, an apparatus for providing flow control (col. 3, lines 51-54, provide an addressing convention for carriage of ATM over Ethernet) for multiple signal streams (fig. 2, flows of cells 39, 39', 39") from a MAC client (fig. 2, E-Mux 21) over a single ETHERNET link (fig. 2, E-Mux 21; col. 7, lines 5-8, E-Mux exchanges ATM cells with an ATM UNI, which is connected in turn to an ARM network...E-Mux 21 is also connected to an Ethernet LAN), comprising: a MAC receiver coupled to the ETHERNET link (fig. 2, E-Mux 21), said MAC receiver receiving MAC frames from the MAC client over the ETHERNET link, each frame containing a PDU (fig. 3A, MAC frame 3) and an indication of the stream to which the PDU belongs (fig. 3A, VPI/VCI 40); a receive addressing module coupled to said MAC receiver (fig. 2, frame manager 33) and to said buffers, said receive addressing module decapsulating the PDUs (col. 8, lines 30-40, provides the payload to PDU manager 31); and a MAC transmitter (fig. 2, E-Mux 21).

Allan et al does not disclose the following features:

Regarding claim 1, a port buffer associated with the stream identified in the MAC frame from which the PDU was decapsulated; monitoring each buffer for fullness; and transmitting a PAUSE control frame from the second MAC client to the first MAC client, the PAUSE control frame indicating the fullness condition of each buffer.

Regarding claim 2, further comprising: controlling the flow of signal streams by temporarily halting the transmission of PDUs belonging to streams associated with buffers which are indicated as congested by the PAUSE control frame.

Regarding claim 4, wherein: the identification is mapped onto an IEEE 802.1Q VLAN (virtual local area network) tag within the MAC frame.

Regarding claim 5, wherein: the identification is an IEEE 802.1Q VLAN (virtual local area network) tag within the MAC frame which is mapped to a port.

Regarding claims 10, 21, 36 and 47, wherein: the PAUSE control frame includes a PAUSE timer value.

Regarding claim 16, storing each PDU in a buffer associated with the stream indicated in the MAC frame; monitoring the fullness of each buffer; and transmitting a PAUSE control frame to the MAC client, the PAUSE control frame indicating the fullness condition of each buffer.

Regarding claim 27, a port buffer associated with the stream identified in the MAC frame from which the PDU was decapsulated, means for monitoring each buffer for fullness, and means for transmitting a PAUSE control frame to said first MAC client, the PAUSE control frame indicating the fullness condition of each buffer.

Regarding claim 28, further comprising: means for controlling the flow of said multiple signal streams in response to said PAUSE control frame, including means for temporarily halting the transmission of PDUs belonging to streams associated with buffers indicated as congested by said PAUSE control frame.

Regarding claim 30, wherein: the identification is mapped onto an IEEE 802.1Q VLAN (virtual local area network) tag within the MAC frame.

Regarding claim 31, wherein: the identification is an IEEE 802.1Q VLAN (virtual local area network) tag within the MAC frame which is mapped to a port.

Regarding claim 42, a plurality of buffers, one buffer associated with each stream; and storing each PDU in a buffer associated with the stream indicated in the MAC frame; means for monitoring the fullness of each buffer; and means for transmitting a PAUSE control frame to the MAC client, the PAUSE control frame indicating the fullness condition of each buffer.

Regarding claim 53, at least one buffer coupled to a source of PDUs (protocol data units) from multiple streams, an addressing and scheduling module coupled to said at least one buffer, a plurality of port buffers coupled to said receive addressing module, each port buffer being associated with the stream identified in the MAC frame from which the PDU was decapsulated, a congestion monitor coupled to said port buffers, said congestion monitor monitoring each buffer for fullness, and a downstream MAC transmitter coupled to said congestion monitor, said downstream MAC transmitter transmitting a PAUSE control frame to said first MAC client, the PAUSE control frame indicating the fullness condition of each buffer.

Regarding claim 54, wherein: said first MAC client a downstream MAC receiver coupled to the ETHERNET link and said addressing and scheduling module, whereby transmission of PDUs belonging to a stream associated with a buffer indicated as congested by the PAUSE control frame is temporarily halted.

Regarding claim 55, a plurality of buffers, one buffer associated with each stream; and storing each PDU in a buffer associated with the stream indicated in the MAC frame; a congestion monitor coupled to said buffers, said congestion monitor monitoring the fullness of each buffer; said MAC transmitter transmitting a PAUSE control frame to the MAC client, the PAUSE control frame indicating the fullness condition of each buffer.

Davies et al discloses flow control and quality of service provision for frame relay protocols, comprising the following features:

Regarding claim 1, a port buffer (fig. 1, input queues 340) associated with the stream identified in the MAC frame from which the PDU was decapsulated (fig. 1, connections 201-208 from MACs 140); monitoring each buffer for fullness (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold); and transmitting a PAUSE control frame from the second MAC client to the first MAC client (fig. 4, process step 46, send a request to the transmitter to suspend transmission), the PAUSE control frame indicating the fullness condition of each buffer (fig. 4, process step 46, queue reaching a given threshold).

Regarding claim 2, further comprising: controlling the flow of signal streams (fig. 4, process step 46, upon the queue associated with a given priority reaching a given

threshold, send a request to the transmitter to suspend transmission, for a given time period, of frames within the given priority) by temporarily halting the transmission of PDUs (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold, send a request to the transmitter to suspend transmission, for a given time period) belonging to streams associated with buffers which are indicated as congested by the PAUSE control frame (fig. 4, process step 46, queue reaching a given threshold).

Regarding claim 4, wherein: the identification is mapped onto an IEEE 802.1Q VLAN (virtual local area network) tag (par. 0052, lines 3-5, 802.1Q marking scheme) within the MAC frame (par. 0052, lines 3-5, 802.1Q marking scheme).

Regarding claim 5, wherein: the identification is an IEEE 802.1Q VLAN (virtual local area network) tag (par. 0052, lines 3-5, 802.1Q marking scheme) within the MAC frame which is mapped to a port (fig. 1, output ports with 802.1Q priority queues).

Regarding claims 10, 21, 36 and 47, wherein: the PAUSE control frame includes a PAUSE timer value (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold, send a request to the transmitter to suspend transmission, for a given time period).

Regarding claim 16, storing each PDU in a buffer (fig. 1, input queues 340) associated with the stream indicated in the MAC frame (fig. 1, connections 201-208 from MACs 140); monitoring the fullness of each buffer (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold); and transmitting a PAUSE control frame to the MAC client (fig. 4, process step 46, send a request to the

transmitter to suspend transmission), the PAUSE control frame indicating the fullness condition of each buffer (fig. 4, process step 46, queue reaching a given threshold).

Regarding claim 27, a port buffer (fig. 1, input queues 340) associated with the stream identified in the MAC frame from which the PDU was decapsulated (fig. 1, connections 201-208 from MACs 140), means for monitoring each buffer for fullness (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold), and means for transmitting a PAUSE control frame to said first MAC client (fig. 4, process step 46, send a request to the transmitter to suspend transmission), the PAUSE control frame indicating the fullness condition of each buffer (fig. 4, process step 46, queue reaching a given threshold).

Regarding claim 28, further comprising: means for controlling the flow of said multiple signal streams (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold, send a request to the transmitter to suspend transmission, for a given time period, of frames within the given priority) in response to said PAUSE control frame, including means for temporarily halting the transmission of PDUs (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold, send a request to the transmitter to suspend transmission, for a given time period) belonging to streams associated with buffers indicated as congested by said PAUSE control frame.

Regarding claim 30, wherein: the identification is mapped onto an IEEE 802.1Q VLAN (virtual local area network) tag (par. 0052, lines 3-5, 802.1Q marking scheme) within the MAC frame (par. 0052, lines 3-5, 802.1Q marking scheme).

Regarding claim 31, wherein: the identification is an IEEE 802.1Q VLAN (virtual local area network) tag (par. 0052, lines 3-5, 802.1Q marking scheme) within the MAC frame which is mapped to a port (fig. 1, output ports with 802.1Q priority queues).

Regarding claim 42, a plurality of buffers (fig. 1, input queues 340), one buffer associated with each stream (fig. 1, connections 201-208 from MACs 140); and storing each PDU in a buffer associated with the stream indicated in the MAC frame (fig. 1, input queues 340); means for monitoring the fullness of each buffer (fig. 4, process step 46, queue reaching a given threshold); and means for transmitting a PAUSE control frame to the MAC client (fig. 4, process step 46, send a request to the transmitter to suspend transmission), the PAUSE control frame indicating the fullness condition of each buffer (fig. 4, process step 46, queue reaching a given threshold).

Regarding claim 53, at least one buffer (fig. 1, input queues 340) coupled to a source of PDUs (protocol data units) from multiple streams (fig. 1, connections 201-208 from MACs 140), an addressing and scheduling module (fig. 1, switch fabric 350) coupled to said at least one buffer (fig. 1, connection between Ethernet RX 301 and switch fabric 350), a plurality of port buffers (fig. 1, input queues 340), each port buffer being associated with the stream identified in the MAC frame from which the PDU was decapsulated (fig. 1, connections 201-208 from MACs 140), a congestion monitor coupled to said port buffers (fig. 1, Ethernet switch 300), said congestion monitor monitoring each buffer for fullness (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold), and a downstream MAC transmitter coupled to said congestion monitor (fig. 1, Ethernet TX 100), said downstream MAC

transmitter transmitting a PAUSE control frame to said first MAC client (fig. 4, process step 46, send a request to the transmitter to suspend transmission), the PAUSE control frame indicating the fullness condition of each buffer (fig. 4, process step 46, queue reaching a given threshold).

Regarding claim 54, wherein: said first MAC client a downstream MAC receiver coupled to the ETHERNET link and said addressing and scheduling module, whereby transmission of PDUs belonging to a stream associated with a buffer indicated as congested by the PAUSE control frame (fig. 4, process step 46, queue reaching a given threshold) is temporarily halted (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold, send a request to the transmitter to suspend transmission, for a given time period).

Regarding claim 55, a plurality of buffers (fig. 1, input queues 340), one buffer associated with each stream (fig. 1, connections 201-208 from MACs 140); and storing each PDU in a buffer associated with the stream indicated in the MAC frame (par. 0050, lines 2-3, directs packets to queues); a congestion monitor coupled to said buffers (fig. 1, Ethernet switch 300), said congestion monitor monitoring the fullness of each buffer (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold); transmitting a PAUSE control frame to the MAC client (fig. 4, process step 46, send a request to the transmitter to suspend transmission), the PAUSE control frame indicating the fullness condition of each buffer (fig. 4, process step 46, queue reaching a given threshold).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Allan et al by using the features, as taught by Davies et al, in order to prevent unnecessary delays to higher priority traffic (Davies et al, abstract, lines 14-17).

5. Claims 6-7, 17-18, 32-33 and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allan et al (U.S. Patent No. 5,946,313) in view of Davies et al (U.S. Patent Application Publication No. 2003/0185249 A1) as applied to claim 1 above, and further in view of Bitner (U.S. Patent No. 5,210,829).

Allan et al and Davies et al disclose the claimed limitations as discussed in paragraph 4 above. Allan et al and Davies et al do not disclose the following features:

Regarding claims 6, 17, 32 and 43 wherein: the PAUSE control frame includes a single bit identifier for each buffer for indicating the fullness condition of the associated buffer.

Davies et al further discloses the following features:

Regarding claims 7, 18, 33 and 44, XON/XOFF flow control (fig. 4, process step 46, upon the queue associated with a given priority reaching a given threshold, send a request to the transmitter to suspend transmission, for a given time period).

Bitner discloses an adjustable threshold for buffer management, comprising the following features:

Regarding claims 6, 17, 32 and 43, wherein: the PAUSE control frame includes a single bit identifier (col. 20, lines 55-59, buffer overflow flag) for each buffer (col. 20, lines 55-59, buffer overflow flag) for indicating the fullness condition of the associated buffer (col. 20, lines 55-59, buffer overflow flag).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Allan et al and Davies et al by using the features, as taught by Bitner, in order to provide reduced host stalls (Bitner, col. 24, line 59), improving performance.

6. Claims 8-9, 19-20, 34-35 and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allan et al (U.S. Patent No. 5,946,313) in view of Davies et al (U.S. Patent Application Publication No. 2003/0185249 A1) as applied to claim 1 above, and further in view of Chuah (U.S. Patent No. 6,115,390).

Allan et al and Davies et al disclose the claimed limitations as discussed in paragraph 4 above. Allan et al and Davies et al do not disclose the following features:

Regarding claims 8, 19, 34 and 45, wherein: the PAUSE control frame includes a two bit identifier for each buffer for indicating the fullness condition of the associated buffer.

Regarding claims 9, 20, 35 and 46, wherein: each two bit identifier identifies an XON/XOFF/NOCHANGE condition.

Chuah discloses bandwidth reservation and collision resolution method for multiple access communication networks where remote hosts send reservation requests to a base station for randomly chosen minislots, comprising the following features:

Regarding claims 8, 19, 34 and 45, wherein: the PAUSE control frame includes a two bit identifier (col. 14, lines 7-16, one-bit XON/XOFF plus one-bit "more data" indication) for each buffer for indicating the fullness condition of the associated buffer.

Regarding claims 9, 20, 35 and 46, wherein: each two bit identifier identifies an XON/XOFF/NOCHANGE (col. 14, lines 7-16, one-bit XON/XOFF plus one-bit "more data" indication) condition.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Allan et al and Davies et al by using the features, as taught by Chuah, in order to provide efficient resolution of conflicts between remote hosts competing for the limited bandwidth available in a wireless network (Chuah, col. 6, lines 5-10).

7. Claims 11-13, 22-24, 37-39 and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allan et al (U.S. Patent No. 5,946,313) in view of Davies et al (U.S. Patent Application Publication No. 2003/0185249 A1) as applied to claim 1 above, and further in view of Ramakrishnan (U.S. Patent No. 6,167,029).

Allan et al and Davies et al disclose the claimed limitations as discussed in paragraph 4 above. Allan et al and Davies et al do not disclose the following features:

Regarding claims 11, 22, 37 and 48, wherein: the PAUSE timer value is set to zero when the PAUSE control frame indicates that no buffer is experiencing congestion.

Regarding claims 12, 23, 38 and 49, wherein: the PAUSE timer is set to a pre-programmed Pause Time Value when the PAUSE control frame indicates that at least one buffer is experiencing congesting.

Regarding claims 13 and 24, further comprising: setting a pause refresh timer each time a PAUSE control frame is transmitted; and transmitting a PAUSE control frame at the expiration of the pause refresh timer if no PAUSE control frame was transmitted since the pause refresh timer was set.

Regarding claim 39, wherein: said second MAC client includes means for setting a pause refresh timer each time a PAUSE control frame is transmitted; a PAUSE control frame being transmitted at the expiration of the pause refresh timer if no PAUSE control frame was transmitted since the pause refresh timer was set.

Regarding claim 50, further comprising: a pause refresh timer, and means for resetting the pause refresh timer each time a PAUSE control frame is transmitted, wherein a PAUSE control frame is transmitted at the expiration of the pause refresh timer if no PAUSE control frame was transmitted since the pause refresh timer was set.

Davies et al further discloses the following features:

Regarding claims 13 and 24, further comprising: setting a pause refresh timer each time a PAUSE control frame is transmitted (par. 0002, line 16, timeout value); and transmitting a PAUSE control frame at the expiration of the pause refresh timer if no PAUSE control frame was transmitted since the pause refresh timer was set (par. 0002, lines 16-20, send another PAUSE frame).

Regarding claim 39, wherein: said second MAC client includes means for setting a pause refresh timer each time a PAUSE control frame is transmitted (par. 0002, line 16, timeout value); a PAUSE control frame being transmitted at the expiration of the pause refresh timer if no PAUSE control frame was transmitted since the pause refresh timer was set (par. 0002, lines 16-20, send another PAUSE frame).

Regarding claim 50, further comprising: a pause refresh timer (par. 0002, line 16, timeout value), and means for resetting the pause refresh timer (par. 0002, lines 19-20, send another PAUSE frame) each time a PAUSE control frame is transmitted (par. 0002, lines 19-20, send another PAUSE frame), wherein a PAUSE control frame is transmitted at the expiration of the pause refresh timer (par. 0002, lines 19-20, send another PAUSE frame) if no PAUSE control frame was transmitted since the pause refresh timer was set (par. 0002, lines 19-20, send another PAUSE frame).

Ramakrishnan discloses a system and method for integrated data flow control, comprising the following features:

Regarding claims 11, 22, 37 and 48, wherein: the PAUSE timer value is set to zero (col. 6, lines 5-6, pause frame with a zero timer value) when the PAUSE control

frame indicates that no buffer is experiencing congestion (col. 6, lines 4-5, almost empty condition).

Regarding claims 12, 23, 38 and 49, wherein: the PAUSE timer is set to a pre-programmed Pause Time Value (col. 10, lines 7-8, pause period that has been established) when the PAUSE control frame indicates that at least one buffer is experiencing congesting (col. 6, lines 2-3, almost full condition).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Allan et al and Davies et al by using the features, as taught by Ramakrishnan, in order to send pause frames more rapidly than conventionally possible (Ramakrishnan, col. 4, lines 65-66).

8. Claims 14-15, 25-26, 40-41 and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allan et al (U.S. Patent No. 5,946,313) in view of Davies et al (U.S. Patent Application Publication No. 2003/0185249 A1) in view of Ramakrishnan (U.S. Patent No. 6,167,029) as applied to claim 13 above, and further in view of Erjanne (U.S. Patent No. 6,490,271 B1).

Allan et al, Davies et al and Ramakrishnan disclose the claimed limitations as discussed in paragraph 7 above. Allan et al, Davies et al and Ramakrishnan do not disclose the following features:

Regarding claims 14, 25, 40 and 51, determining whether congestion conditions have changed since the last PAUSE control frame was transmitted.

Regarding claims 15, 26, 41 and 52, wherein: the pause delay timer is of shorter duration than the pause refresh timer.

Davies et al further discloses the following features:

Regarding claims 14 and 25, further comprising: setting a pause delay timer each time a PAUSE control frame is transmitted (par. 0002, line 16, timeout value); and transmitting a PAUSE control frame at the expiration of the pause delay timer (par. 0002, lines 16-20, send another PAUSE frame).

Regarding claim 40, means for setting a pause delay timer each time a PAUSE control frame is transmitted (par. 0002, line 16, timeout value); and transmitting a PAUSE control frame at the expiration of the pause delay timer (par. 0002, lines 16-20, send another PAUSE frame).

Regarding claim 51, means for resetting a pause delay timer each time a PAUSE control frame is transmitted (par. 0002, line 16, timeout value), wherein a PAUSE control frame is transmitted at the expiration of the pause delay timer (par. 0002, lines 16-20, send another PAUSE frame).

Erjanne discloses a method and apparatus for dynamic radio resource controlling, comprising the following features:

Regarding claims 14, 25, 40 and 51, determining whether congestion conditions have changed since the last PAUSE control frame was transmitted (col. 6, lines 50-55, service level change).

Regarding claims 15, 26, 41 and 52, wherein: the pause delay timer is of shorter duration than the pause refresh timer (col. 6, lines 58-59, timer expires).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Allan et al and Davies et al by using the features, as taught by Erjanne, in order to provide benefits from the dynamic nature of data links and reduce the need for special application software (Erjanne, col. 2, lines 62-67).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Richter et al (U.S. Patent No. 5,995,491) discloses a method and apparatus for multiple media digital communication system. Myers (U.S. Patent Application Publication No. 2002/0146023 A1) discloses a transport stream multiplexer utilizing smart fifo-meters. Fischer (U.S. Patent No. 5,103,446) discloses local area network adaptive throughput control for instantaneously matching data transfer rates between personal computer nodes. Frazier et al (U.S. Patent No. 6,029,202) discloses full duplex flow control for Ethernet networks. Esteve et al (U.S. Patent No. 6,011,805) discloses a method and apparatus for auto-adapting a retry timer to avoid de-synchronization of communication protocols. Linville et al (U.S. Patent No. 6,026,075) discloses a flow control mechanism.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nick Deichmeister whose telephone number is (571) 272-9746. The examiner can normally be reached on Monday through Friday (off alternate Fridays).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NFD

KWANG BIN YAO
SUPERVISORY PATENT EXAMINER